

---

# **Suisun Marsh Monitoring Program Channel Water Salinity Report**

Reporting Period: February 2005

---

Questions regarding this report should be directed to:

**Jim Sung**

California Department of Water Resources  
Division of Environmental Services  
3251 S Street  
Sacramento, CA 95816-7017

Telephone: (916) 227-7520  
[sung@water.ca.gov](mailto:sung@water.ca.gov)

**TABLE OF CONTENT**

<b>1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT .....</b>	<b>1</b>
<b>2. MONITORING RESULTS.....</b>	<b>2</b>
2.1 CHANNEL WATER SALINITY COMPLIANCE .....	2
2.2 DELTA OUTFLOW .....	2
2.3 RAINFALL .....	3
2.4 SUISUN MARSH SALINITY CONTROL GATE (SMSCG) OPERATIONS .....	3
<b>3. DISCUSSION.....</b>	<b>3</b>
3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH .....	3
3.2 OBSERVATIONS AND TRENDS.....	4
3.2.1 <i>Conditions during the Reporting Period</i> .....	4
3.2.2 <i>Comparison of Reporting Period Conditions with Previous Years</i> .....	4

## 1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

---

\* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

## 2. Monitoring Results

### 2.1 Channel Water Salinity Compliance

During the month of February, 2005, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of February was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for compliance stations C-2, S-64, S-49, S-42 and S-21 were 8.0 mS/cm during February 2005. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

### 2.2 Delta Outflow

The February Delta outflow ranged between 10,000 cfs to 35,000 cfs. Outflow started off above 25,000 cfs in February as carry over result of the end of January precipitation event, then peak to about 32,000 cfs before decreasing to about 13,700 cfs by February 9, 2005. Thereafter, outflow increased to about 17,600 cfs briefly as a result of exports reduction to met water quality standard, and then dropped again to about 13,700 cfs for a short period. Thereafter, precipitation events from mid-February to February 24 resulted outflow to increase and peak for a February high of about 35,000 cfs. Thereafter, outflow decreased due to minimal amount of precipitation event occurring for the remainder of February, except on February 28, where 0.57 inches of precipitation action resulted outflow to increase and ended the month around 32,000 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for February is listed below:

Month	Mean NDOI (cubic feet per second)
February	23,210

## 2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during February 2005 was about 1 inch less than the previous month January total and is listed below: The largest precipitation occurred on February 16 with the daily total of 1.33 inches.

Month	Total Rainfall (inches)
February	4.24

## 2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during February 2005 is summarized below. The gates continued to be operated to control salinity with boat lock open configuration per NOAA request for the remainder of the control season.

Date	Gate status	Flashboards status	Boat Lock status
February 1-8	<b>1 gate operating</b>	Installed	Open
February 9-28	<b>Open</b>	Installed	Open

During February 2005, SMSCG operation was with only 1 gate (i.e. Gate 2) through February 8, 2005. On February 9, 2005, gate operations ceased due to good water quality levels in the marsh and will resume as needed in the future to meet water quality concerns.

## 3. Discussion

### 3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

## **3.2 Observations and Trends**

### **3.2.1 Conditions during the Reporting Period**

During February 2005, salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), Sunrise Club(S-21), and Volanti(S-42) were no higher than 4.0 mS/cm as shown in Figure 1. At the two monitoring stations, S-97 salinity levels ranged from 4.0 mS/cm to 6.0 mS/cm, and S-35 ranged from 4.5 mS/cm to 7.0 mS/cm, as shown in Figure 2. Salinity levels at both eastern and western marsh stations were already low at the beginning of February due to high Delta outflow carry over from January. Due to continued good water quality conditions, gate operation was suspended on February 9. With continued outflow begin above 20,000 cfs in early February and more precipitation events in mid-February which resulted outflow to peak at 35,000 cfs in late February, salinity levels throughout the marsh remain very low. By mid-February, all compliance and monitoring stations salinity levels were so fresh that they leveled out for the rest of the month.

Overall, salinity levels were well below standards at all compliance and monitoring stations.

### **3.2.2 Comparison of Reporting Period Conditions with Previous Years**

Monthly mean high-tide SC at the compliance and monitoring stations for February 2005 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations are similar to that of 2004, except at S-21, S-35, and S-97, where salinity is higher in magnitude than 2004. Compared to previous nine years, February 2005 salinity levels were ranked fourth in high Specific Conductance.

**Table 1****Monthly Mean High Tide Specific Conductance at Suisun Marsh  
Water Quality Compliance Stations****February 2005**

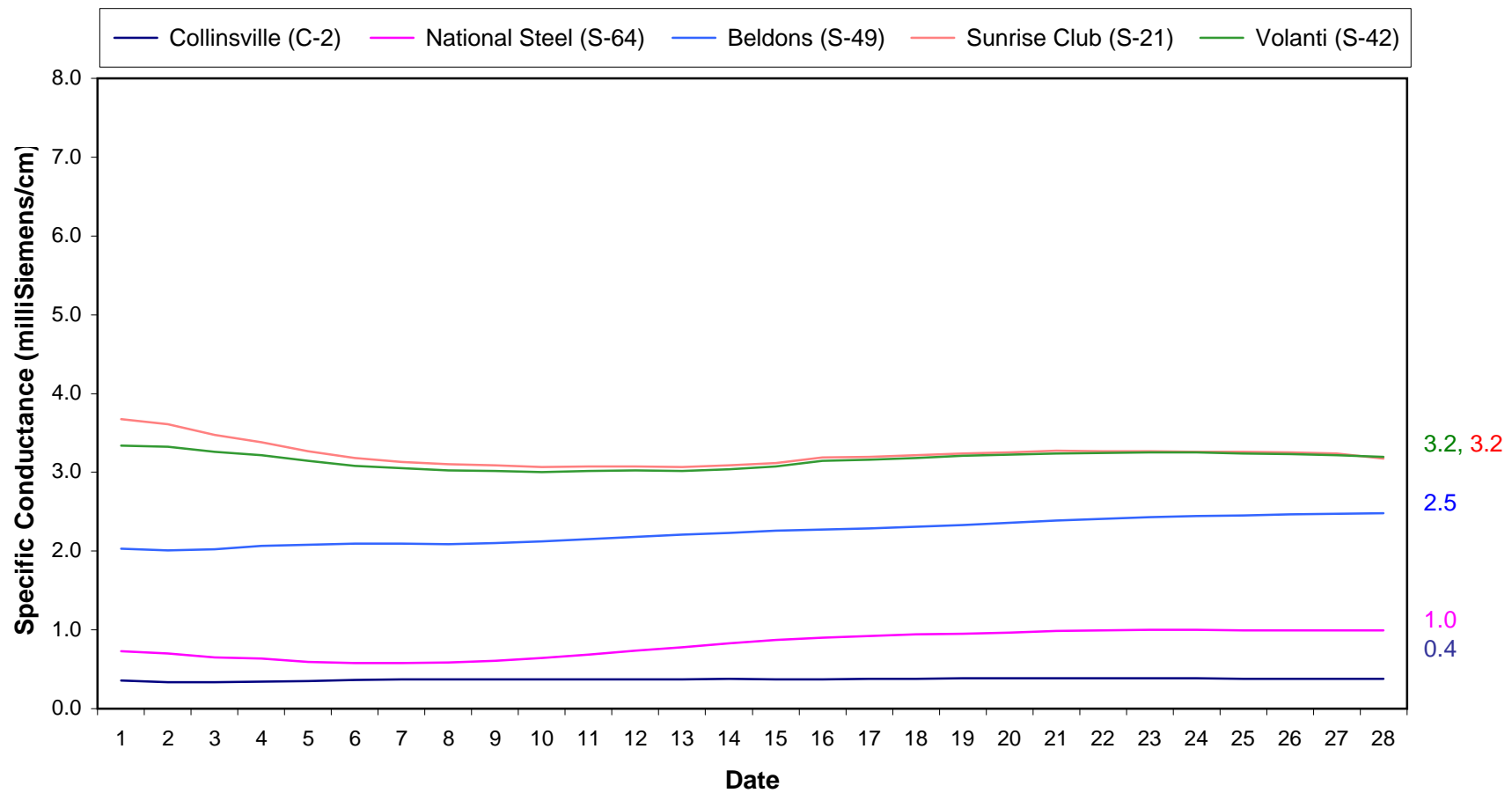
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.4	8.0	Yes
S-64	1.0	8.0	Yes
S-49	2.5	8.0	Yes
S-42	3.2	8.0	Yes
S-21	3.2	8.0	Yes

\*milliSiemens per centimeter

\*\*The representative data from nearby USBR station is used in lieu of data from station C-2.

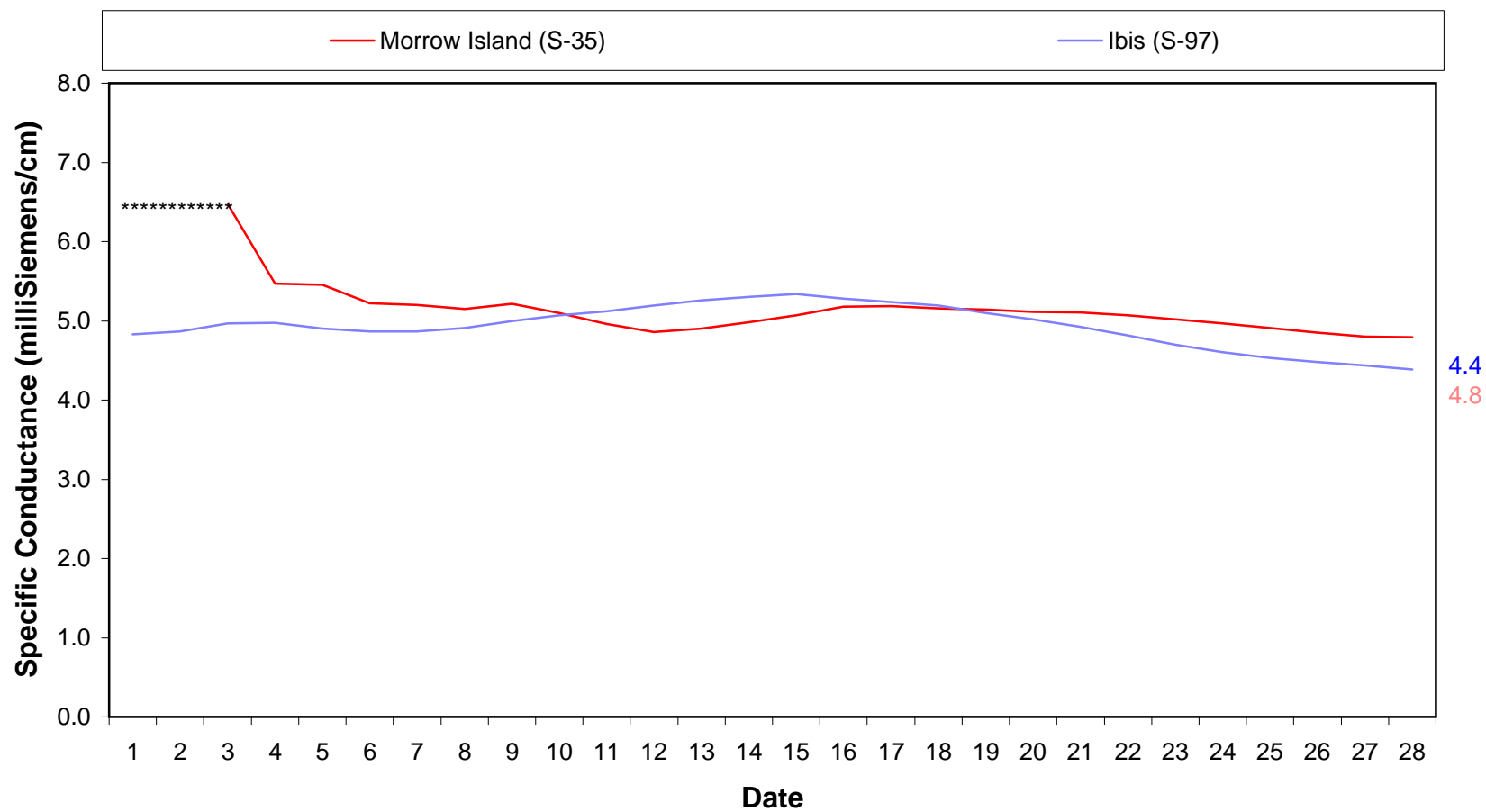
**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance  
February 2005**

Standard = 8.0 mS/cm

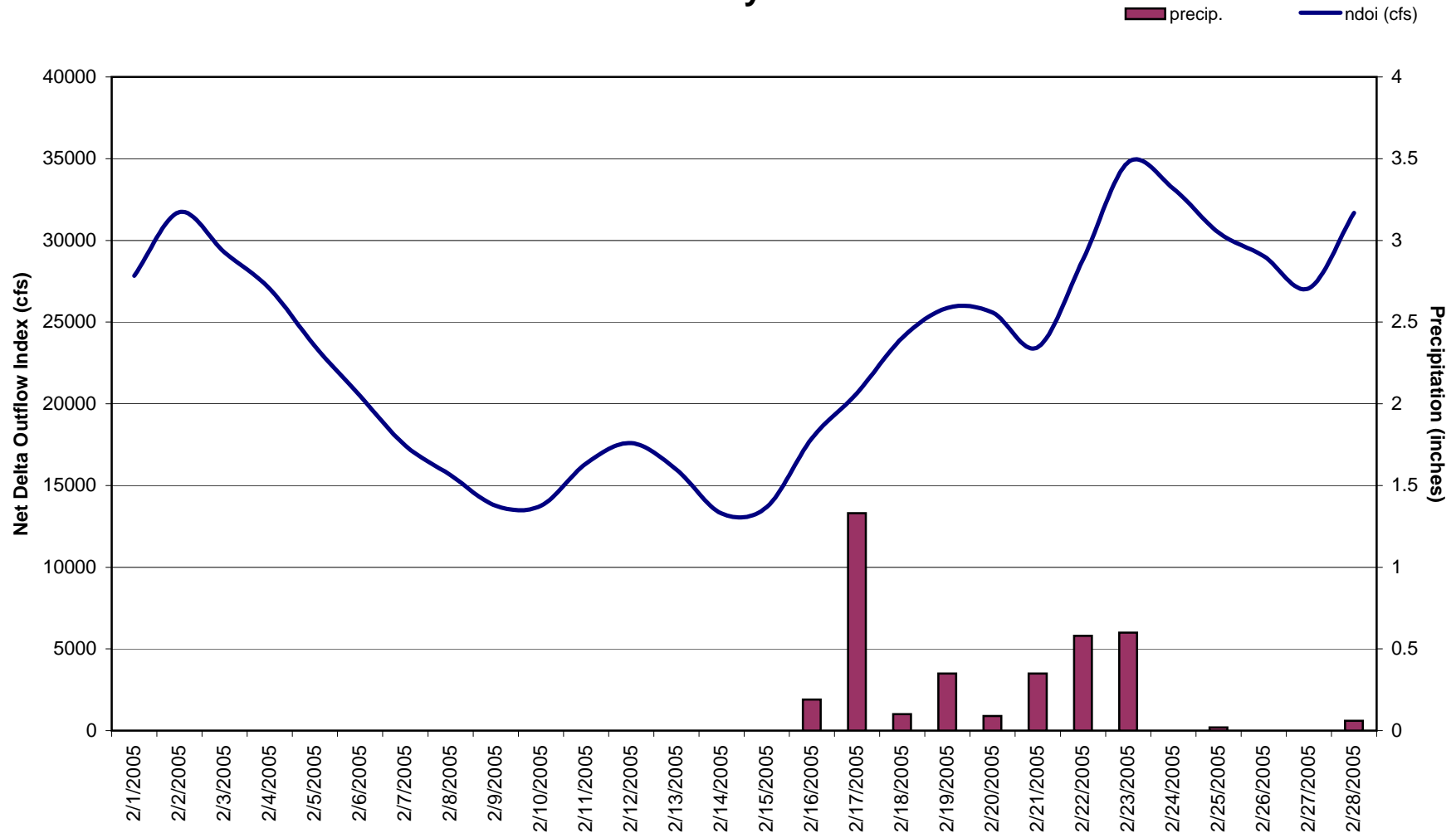




**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance  
February 2005**

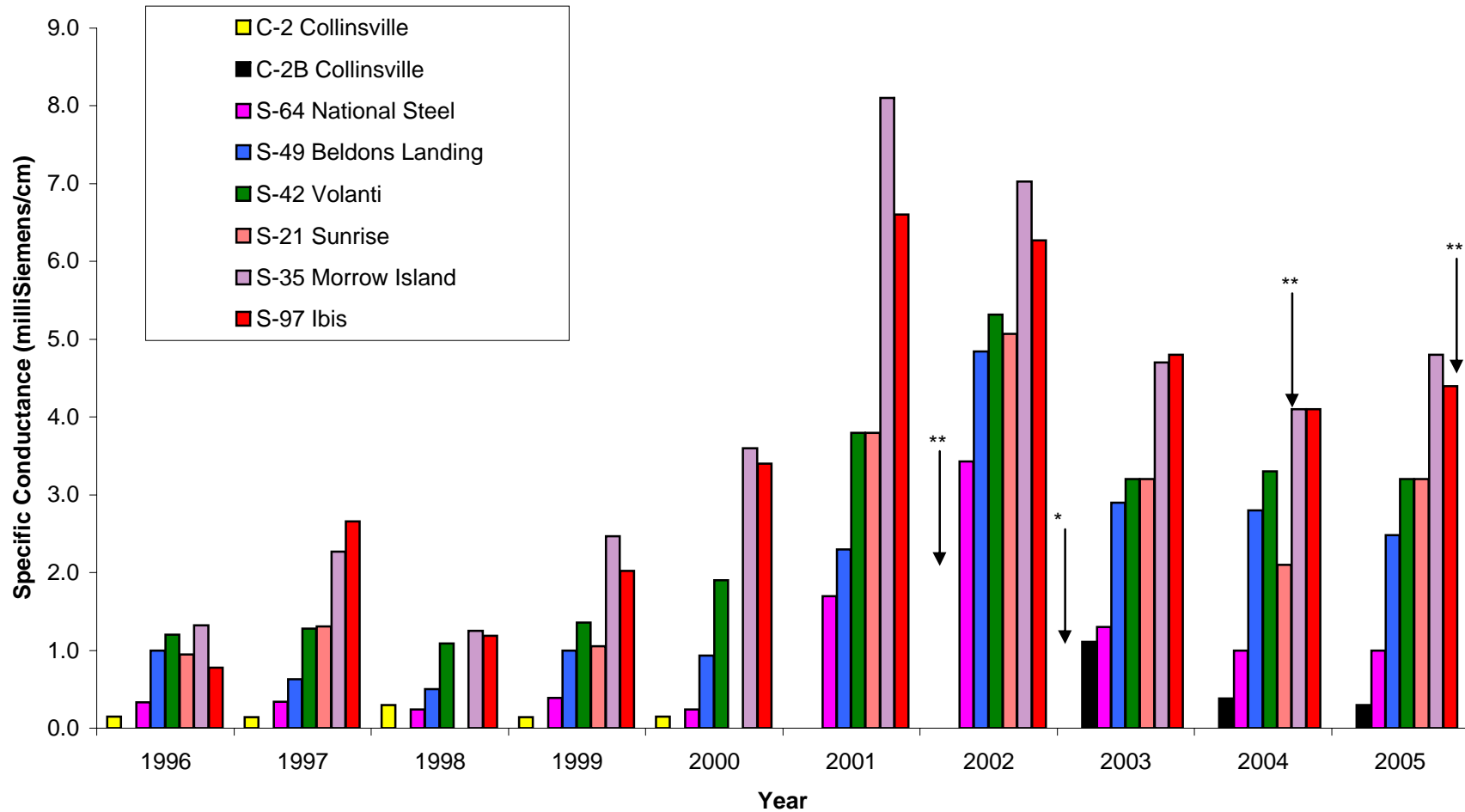


**Figure 3. Daily Net Delta Outflow Index and Precipitation\*  
February 2005**



\*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

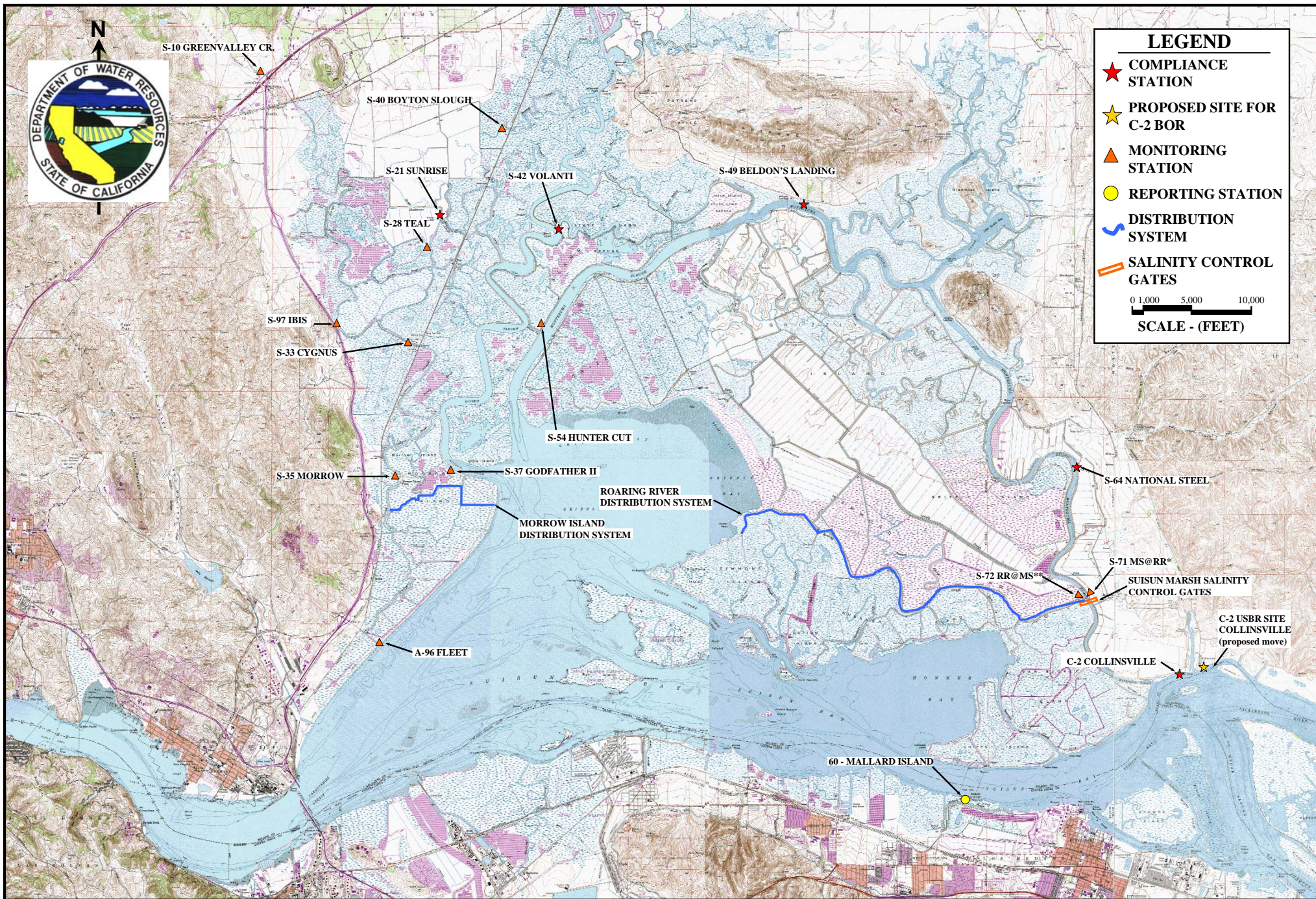
**Figure 4. Monthly Mean Specific Conductance at High Tide:  
Comparison of Monthly Values for Selected Stations  
February of 1996-2005**



\*Representative data from nearby USBR station is used in lieu of station C-2 from 2002 and thereafter.

\*\*Data missing due to equipment failure. Number of missing data is small enough not to alter end of month value.





## SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES